CLAIMS

1. A method of determining, in a noise reduction process applied to a signal affected by background noise, an update function relating a new value of estimated noise power (P_{noise_New}) with a previous value of estimated noise power (P_{noise}), said update function being a function of said previous estimated noise power (P_{noise}) and a mean input power spectral density (P_{in_PSD}), characterized in that it includes the steps of:

- providing a look-up table (30) having stored therein values for said update function,
- determining a current value for said mean input power spectral density (P_{in_PSD}), and
- searching a corresponding value for said update function in said look-up table (30) using said previous value of estimated noise power (P_{noise}) and said current value for said mean input power spectral density (P_{in_PSD}) as a first and a second entry for said search.

2. The method of claim 1, characterized in that it includes the steps of providing a look-up table (30) having stored therein values for said update function, said update function being a function of a ratio (SNR) of said mean input power spectral density (P_{in_PSD}) and said previous estimated noise power (P_{noise}).

3. The method of claim 1, characterized in that it includes the steps of performing said search in said look-up table (30) based on an index (26) computed starting from said first and second search entries.

4. The method of claim 1, characterized in that said values for said update function are stored in said look-up table (30) as representative of a surface plotted against said first (x) and said second (y) entry, wherein said surface is partitioned in a plurality of regions having each a corresponding value

for said update function, said constant value regions being separated by straight lines with known angular coefficients.

5. The method of claim 4, characterized in that it includes the step of partitioning at least one portion of said surface in a plurality (2N) of angular regions, wherein said angular regions are selected from the areas between the straight lines:

$$y = j \cdot x / N \quad \text{when} \quad P_{in\_PSD} < P_{noise}$$
$$y = N \cdot x / j \quad \text{when} \quad P_{in\_PSD} >= P_{noise}$$

with j assuming integer values from 1 to N, and wherein said first and second entries for the search are plotted on the x and the y-axis, respectively.

6. The method of claim 4, characterized in that, wherein said first and second entries are plotted on the x-axis and the y-axis, respectively, it includes the steps of subdividing said surface in:

- a first portion between the line y = N.x and the x-axis, said first portion being subdivided on the basis of a linear approximation in a first plurality of regions wherein the lines partitioning said first plurality of regions define constant intervals therebetween at said x or y axis, and

- a second portion comprising the remaining portion of said surface, said second portion being subdivided on the basis of a linear approximation in a second plurality of regions wherein the lines partitioning said second plurality of regions are determined by the equation:

$$y = NH \cdot N \cdot x / j$$

with j going from 1 to NH-1 integer values.

7. The method of claim 4, characterized in that, wherein said first and second entries are plotted on the x-axis and the y-axis, respectively, it includes the steps of subdividing said surface in:

- a first portion between the line $y = N.x$ and the x-axis, said first portion being subdivided on the basis of a linear approximation in a first plurality of regions wherein the lines partitioning said first plurality of regions define constant intervals therebetween at said x or y axis, and

- a second portion comprising the remaining portion of said surface, said second portion being subdivided on the basis of an exponential approximation in a second plurality of regions wherein the lines partitioning said second plurality of regions are determined by the equation:

$$y = 2^j \cdot N \cdot x$$

with j assuming the integer values from 1 to NH.

8. A circuit (50) for determining, in a filter (40) for noise reduction in a signal affected by background noise, an update function relating a new value of estimated noise power (P_{noise_New}) with a previous value of estimated noise power (P_{noise}), said update function being a function of said previous estimated noise power (P_{noise}) and a mean input power spectral density (P_{in_PSD}), characterized in that it includes:

- a look-up table (30) having stored therein values for said update function,

- an input module (10) for a current value for said mean input power spectral density (P_{in_PSD}), and

- search circuitry (12 to 28) associated with said look-up table (30) for selectively searching values for said update function in said look-up table (30) using said previous value of estimated noise power (P_{noise}) and said current value for said mean input power

spectral density (P_{in_PSD}) as a first and a second entry for said search.

9. The circuit of claim 8, characterized in that it said a look-up table (30) has stored therein values for said update function being a function of a ratio (SNR) of said mean input power spectral density (P_{in_PSD}) and said previous estimated noise power (P_{noise}).

10. The circuit of claim 8, characterized in that search circuitry (12 to 28) associated with said look-up table (30) is configured for performing said search in said look-up table (30) on the basis of an index (26) computed starting from said first and second search entries.

11. The circuit of claim 8, characterized in that it said values for said update function are stored in said look-up table (30) as representative of a surface plotted against said first (x) and said second (y) entries, wherein said surface in said look-up table (30) is partitioned in a plurality of regions each corresponding to a given constant value for said update function, said constant value regions being separated by straight lines with known angular coefficients.

12. The circuit of claim 11, characterized in that said at least one portion of said surface includes a plurality (2N) of angular regions, wherein said angular regions are selected from the areas between the straight lines:

$y = j \cdot x / N$ when $P_{in\_PSD} < P_{noise}$

$y = N \cdot x / j$ when $P_{in\_PSD} >= P_{noise}$

with j assuming integer values from 1 to N, and wherein said first and second entries in the table are plotted on the x and the y-axis, respectively.

13. The circuit of claim 11, characterized in that it said values for said update function are stored in

said look-up table (30) as representative of a surface plotted against said first (x) and said second (y) entries, wherein the surface in said look-up table (30) is partitioned in:

- a first portion between the line $y = N.x$ and the x-axis, said first portion being subdivided on the basis of a linear approximation in a first plurality of regions wherein the lines partitioning said first plurality of regions define constant intervals therebetween at said x or y axis, and

- a second portion comprising the remaining portion of said surface, said second portion being subdivided on the basis of a linear approximation in a second plurality of regions wherein the lines partitioning said second plurality of regions are determined by the equation:

$$y = NH \cdot N \cdot x \ / \ j$$

with j going from 1 to NH-1 integer values.

14. The circuit of claim 11, characterized in that said values for said update function are stored in said look-up table (30) as representative of a surface plotted against said first (x) and said second (y) entries, wherein the surface in said look-up table (30) is partitioned in:

- a first portion between the line $y = N.x$ and the x-axis, said first portion being subdivided on the basis of a linear approximation in a first plurality of regions wherein the lines partitioning said first plurality of regions define constant intervals therebetween at said x or y axis, and

- a second portion comprising the remaining portion of said surface, said second portion being subdivided on the basis of an exponential approximation in a second plurality of regions wherein the lines

partitioning said second plurality of regions are determined by the equation:

$$y = 2^{j} \cdot N \cdot x$$

with j assuming the integer values from 1 to NH.

15. A filter (40), characterized in that it includes a circuit (50) according to any of claims 8 to 14 for estimating noise power.

16. The filter of claim 15, characterized in that said filter (40) is a Wiener filter

17. A mobile terminal (TM) including a filter according to claim 15 for noise reduction of speech signal.

18. A communication network including a mobile terminal according to claim 17.

19. A computer program project loadable in the memory of at least one computer and including software code portions for performing the method of any of claims 1 to 7.